

ABSTRACT OF THE DISCLOSURE

Methods and apparatus are provided for obtaining spatial information about an object, and for measuring the dielectric constant of an object. They include placing the object in a cavity and interacting electromagnetic radiation at a plurality of frequencies with the object to obtain a corresponding plurality of measured resonant transverse magnetic modes. They also include using the plurality of measured resonant transverse magnetic modes to obtain the spatial information for the object, and/or using the plurality of measured resonant transverse magnetic modes to obtain the dielectric constant for the object.